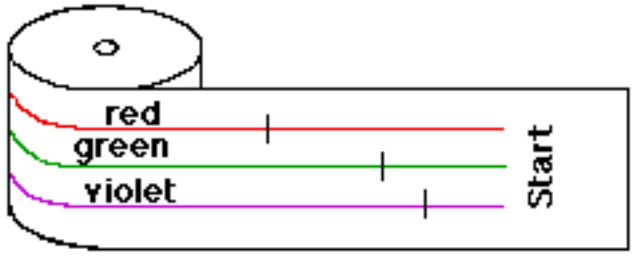
What's the Frequency, Roy G. Biv?

Guided Practice or Developmental Procedure

1. Triad decides who is
   - Recorder/ Reader
   - Materials Manager/ Checker
   - Time Keeper/ On Task Coordinator

2. Materials Manager retrieves all materials listed from teacher.

3. Recorder should draw a vertical line about 20 cm from the beginning of the adding machine tape and label it "Start" (see below). With the metric ruler, make a point 100 cm from the starting point. Draw a vertical line and label it "End". Cut the tape off of the roll leaving about 20 cm space between "End" and where you cut.



Note: This is how to get started, keep labeling the colors until you reach 100 cm.

4. Materials Manager should use the colored pencils to draw three evenly spaced horizontal lines along the tape from Start to End. Make the top line red, the middle line green and the bottom line violet to represent three different colors in the spectrum of light.

   (NOTE: The Time Keeper/ On Task Coordinator should continually keep everyone focused in order to complete this lab. He or she may also share in the completion of the tasks.)

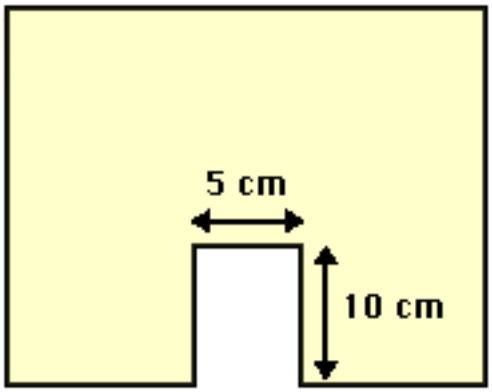
5. Recorder should divide the red line every 14 cm with dark marks in red pencil. The green line should be divided every 10 cm and the violet every 8 cm. The marks that you make on the three color lines will represent the different wavelengths of the different colors of light.

   (The true wavelengths are actually measured in terms of Angstroms. An angstrom is 10^{-8} cm or 0.00000001 cm. Red has a wavelength of 7800-6220 Angstroms, green has a wavelength of 5770-4920 Angstroms and violet has a wavelength of 4550-3900

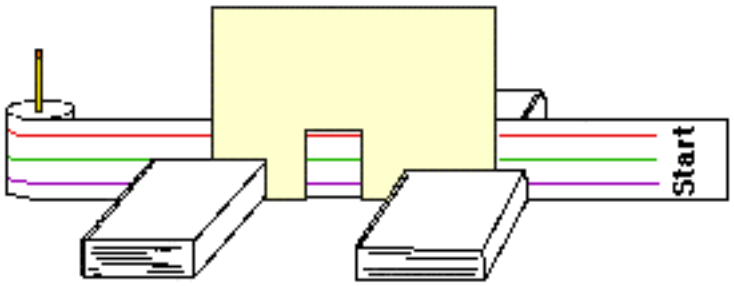
Angstroms. However, in this lab, the simple relationship among the visible light waves will be what is important.)

6. Materials Manager should use masking tape to fasten the marked adding machine tape to a pencil.

7. Recorder should cut a manila folder along its crease. Then cut a rectangle out of the center of one of the long sides. This rectangle should be about 10 cm high and 5 cm wide as shown below.



8. Materials Manager should set the manila folder cut out on the table supporting it with the four books (see below). Feed the end of the adding machine tape through the narrow space between the manila folder and the two back books until "Start" appears in the middle of the opening in the manila folder.



9. Recorder should now be prepared with the Data Table and sit in front of the tape and manila folder model.

10. Time Keeper should call "start" and begin timing as he or she slowly pulls the tape along. Try to pull the tape at about the same speed for every trial!

11. Recorder should tally in the appropriate box on the data table every time he or she sees a wavelength mark. When "End" appears, tell the Time Keeper to stop timing.

12. Each Triad should make a "trial run" and then repeat the procedure an additional 3 times.

13. On the data table, Materials Manager determines and records the average number of wavelengths observed for each color and the average time (in seconds) from start to finish.

14. Recorder should determine and record the frequency for each of your colored light waves. Note: frequency is defined as the number of wavelengths passing a given point per second.